

# Knowledge and Awareness of Virtual Learning Environments Among Ghanaian University Students and its Implications for Global Education

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## ABSTRACT

The study examined the perception of University Students on the benefits, knowledge and awareness of virtual learning environments and their impact on international education and curriculum development. The descriptive survey design was employed with a sample size of 264 Business students randomly selected from the Business department of the University of Education, Kumasi Campus in Ghana. The Logistic Regression analysis was also utilized to estimate predictors of the usage of virtual learning among the respondents at 0.05 level of significance. Results from the study showed that majority of the students had sufficient understanding of the benefits of the virtual learning environments in enhancing international education and had in-depth knowledge in the influx of the applications of the virtual learning devices. Results from the logistic regression analysis also revealed that predictors such as sex and place of residents of respondents significantly influence their usage and knowledge of virtual learning devices. The Nagelkerke R- square of 0.7 and Cox & Snell R- Square of 0.56 indicated the goodness of fit. It is recommended that curriculum designers and lecturers incorporate the virtual learning technologies into their teaching pedagogy to enhance learning and teaching in this current global world.

**Keywords:** Virtual learning, Awareness, University Students, Ghana.

## 1. Introduction

With the advent of globalization and growing information and communication technology in the recent century, several educational experts and researchers have competently identified the weaknesses of the traditional face-to-face classroom teaching and learning method in accomplishing world-class education. They argue that this traditional face-to-face classroom teaching and learning method alone can no longer enhance effectiveness of teaching and learning to meet the expectation of learners and international education competitiveness (Ravitz, 2006; Jonassen& Land, 2000). In that, it does not expand the opportunity of learners especially university students to have access to international education and modern technology.

The traditional face – to- face method of teaching and learning that is confined only within the walls of classrooms as criticized by educational experts does not allow students to participate in international education across the boundaries of their own geographical locations and cannot have the means to share knowledge with their foreign students' counterparts in different countries.

Unfortunately, students' inability to participate in the global education does not make them competitive in the global world. As Dede *et al.*, (2004) conclude that the traditional classroom methods alone does not make learners more literate in the international level and prevents their active participation especially in the global push for the adoption of information and communication technology in this technological world.

Interestingly, studies such as Schutt and Linegar, (2013) opine that virtual learning should be integral part of teaching pedagogy in this information age to complement the traditional face – to- face classroom methods of teaching and learning.

Virtual learning is generally described as the kind of learning that involves electronic devices that deviates from the traditional classroom face- to- face teaching and learning which makes it possible for learners to flexibly use the internet, digital platforms, satellite broadcast, electronic media especially through emails, portals, social media, blogs, e-books among others (Godvinsamy, 2007 & Sonyemi *et al.*, 2012).

Virtual learning allows learners to participate in global learning across the boundaries of their countries and according to Teo (2008) it enhances a higher order thinking of students in the learning process. A similar study by Dede *et al.*, (2004) reveal that there are certain activities which are very difficult to be identified in the traditional face-face environment which are however easily performed in the virtual learning environment. They assert that virtual learning in this recent times has an increased promise for high academic performance,

improved critical thinking, scientific enquiry, and science and technology study and developed the learners' competencies in communication. Virtual learning approach again, according to Barker & Ansorge (2007) helps in incorporation of the current research findings into the curriculum to make the curriculum more significant for the learners and in their bid to achieve the expected goals. This helps to expose the learners to the real world situations and become aware of the various events, technological progress and dynamics that are occurring in the current world (Niemitz *et al.*, 2008).

However, some researchers argue that some university lecturers fail to apply the influx of the virtual learning models due to their low knowledge in their application and feel that it is a threat to their competencies. In this case they only employ the traditional face-face classroom method of teaching to avoid inconveniences (Godvinsamy, 2007 & Sonyemi *et al.*, 2012). This does not indeed give them the opportunity to catch up with the international standards in higher learning curriculum expectations. In Ghana, where there are about 19 public universities and 78 private universities (NAB, 2017), almost all these universities practice the traditional face-to-face classroom teaching and learning methods. At the same time, all these traditional Universities aim at preparing their students to become competitive in the global world in this information age. Findings by Osei *et al.*, (2014) have also indicated that, factors such as age, sex, and income level have strong influence on the use of virtual learning devices. So, the question to unravel is how would these universities be able to accomplish the expectations of achieving international education if they continue to utilize the traditional face-to-face classroom teaching and learning methods alone which cannot make student literate and competitive in the global world in this information age and the students also do not come in touch with virtual learning technologies.

Motivated by this background, this study sought to examine the awareness and knowledge of the university students on the virtual learning and its benefits in achieving international education and meeting the expectations of their teaching curricular especially in this information age. More ambitiously, the study sought to:

- i. Identify the benefits of virtual learning to achieving international education from the views of university students.
- ii. Estimate the predictors of the use and knowledge of virtual learning device among the students.

The outcome of the study would help curriculum designers and educational policy makers to decide on which instructional medium should be promoted and integrated into the traditional teaching and learning methods in order to achieve a successful world-class education. The results from this study would again help actors of education and students to become fully aware of the benefits virtual learning in achieving world class education and becoming globally competitive. The study explores the students' knowledge about the virtual learning technology and this will help lecturers to identify students' competence and decide how they would integrate this technology in their teaching pedagogy. The outcome of this study would more importantly serve as a baseline information for future researchers in the area.

## 2. Methodology

The study employed descriptive survey research design. Descriptive survey research studies are designed to obtain pertinent information concerning current status of phenomenon, especially knowledge and awareness of technology. This method is suitable because it determines the nature of existing state and is a self-report study which requires the collection of both qualitative and quantifiable information from the sample participants. It is efficient in collecting large amounts of information within a short time.

The study was conducted at the University of Education Winneba, Kumasi Campus in Ghana. This University has been regarded as the fastest growing public university charged with teacher education and the responsibility of producing professional educators in Ghana. The choice of University of Education, Winneba was motivated by the fact that it is the youngest University of Education to operate a multi-satellite campus system in Ghana. Currently the University of Education established in 1992 has five campuses offering academic programs by regular /full time, distance learning and sandwich and award certificates comprising diploma, undergraduate degree, masters and doctor of philosophy degree in Education.

A multi-stage sampling procedure was employed. In the first stage the Kumasi campus was randomly selected from the five campuses of the University of Education Winneba using simple random sampling. The university of education Kumasi campus has four major faculties namely, faculty of technical education, vocational education, communication sciences, and business education. In the second stage, the faculty of Business Education was again randomly selected for the study and clustered based on year of enrolment and the level 300 year group was selected to constitute the final population size and subsequently selecting the final sample size. The study specifically used sample survey procedure to enhance data collection and analysis of the data. The sample size for the study constituted 264 level 300 students.

The formula developed by Yamane1973 for calculating sample size was used to determine the sample size for the study. The formula is given as:  $n = \frac{N}{1 + N(e)^2}$

Where

n = the required sample size. N = the population size

e=Tolerable error (which in this study was pegged at 0.05). The sample size is thus calculated as follows:

$$n = \frac{775}{1 + 775(0.05)^2}$$

$$n = 264$$

The formula that will be used in calculating the sample to be taken from each stratum is given below:

$$n_h = \frac{N_h}{N} \times n$$

Where:

$n_h$ =sample size of stratum h.  $N$  =Total size of population

n=Total sample size

$N_h$ =Population size of stratum h. The sample to be taken from each year group is calculated as follows:

$$\text{Level 300 females : } n_h = \frac{243}{775} \times 264$$

= 83 female students

$$\text{Level 300 males : } n_h = \frac{532}{775} \times 264 = 181 \text{ Male students}$$

The study used questionnaire as the main instrument for the data collection although, interview method was also used to further clarify and cross check certain information that occurred in the questionnaire.

### Data analysis

The data collected from respondents were first verified and organized for further analysis.

The organized data was coded in SPSS (a statistical package for social sciences) version 16.0 computer software. The coded data was then analyzed with the SPSS and the results presented in tables and charts. The descriptive statistics were presented in frequencies, percentages, standard deviation, and means using tables, charts and graphs. The results were further analyzed and discussed line with the objectives. The study employed a logistic regression model to estimate the factors that influence students' knowledge and experience with the use of virtual learning technology. This model is among the discrete choice models that are used when a dependent variable is categorical or has a binary response. Example, if a student has knowledge in virtual learning (Yes' or 'No'.)

In the analysis of binary response, two main models thus, (logit and probit models), dominate in practice (Green, 2008). For the sake of simplicity, this study used logistic model described below.

The discrete choice model is based on the principle that the decision-maker chooses the outcome that maximizes the utility.

Let decision-maker  $i$  choose from a set of mutually exclusive alternatives,  $j = 1; \dots, J$ .

The decision-maker obtains a certain level of utility  $U_{ij}$  from each alternative. It is not possible to observe utility gain, but some attributes of the alternatives as faced by the decision-maker can be observed. Hence, the utility is decomposed into deterministic  $V_{ij}$  and random part  $\varepsilon_{ij}$

$$U_{ij} = V_{ij} + \varepsilon_{ij} \dots \dots \dots 2$$

Since  $\varepsilon_{ij}$  is not observed, the decision-makers choice cannot be predicted exactly. Instead, the probability of any particular outcome is derived. The unobserved term is treated as random with density  $f(\varepsilon_{ij})$ . The joint density of the random vector  $\varepsilon_{ij} = \varepsilon_1, \dots, \dots, \varepsilon_{ij}$  is denoted  $f(\varepsilon_{ij})$ . Probability that decision-maker  $i$  chooses alternative  $j$  among  $J$  alternatives is

$$p_{ij} = \Pr(U_{ij} > U_{ij}), j \neq 1$$

This implies that, the decision maker only chooses the alternative that yield the highest utility to him.

Let  $Y$  represent the binary response variable, the binary variable is defined as

$$Y = \begin{cases} 1 & \text{if student has knowledge in virtual learning} \\ 0 & \text{if student has no knowledge in virtual learning} \end{cases}$$

The logistic regression measures the likelihood effect and association between the binary variable and the explanatory variables. This model is given by

$$P_i = \frac{e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}{1 + e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}$$

The logistic model in that sense is given by

$$1 - P_i = 1 - \frac{e^{\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}}{1 + e^{\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}}$$

Taking the natural log transformation of the odds of logistic model in Equation (4) gives the logit model presented in Equation 5

$$\text{Logit}(P_i) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + e_i$$

where  $\alpha$  is the intercept,  $\beta^i$ s are the parameter estimates or the coefficients of the explanatory variables  $X_1, X_2, X_3, \dots, X_p$  and  $P_i$  is the probability of  $i$ th individual.

### 3. Results and Discussions

This chapter discusses the results of the study in accordance with the stated research objectives. The study sought to find whether respondents are aware of virtual learning or not, their knowledge on the benefits of virtual learning to international education, the goals and determinants of the usage of virtual learning.

The basic characteristic features of the respondents were analyzed. These include the age of respondents, their gender and course of study.

**Table 1: demographic features of respondents**

AGE OF RESPONDENTS	FREQUENCY	PERCENTAGE
16-20 years	62	23.5%
21-25 years	102	38.6%
26-30 years	59	22.3%
31-35 years	26	9.8%
36 years and above	14	5.3%
SEX		
Male	181	69%
Female	83	31%

The results from Table 1 shows that out of the 264 students who participated in the study, 38.6 % were within the age group (21- 25 years) representing the majority. Again, about 23.5% of the respondent were Ages between the ages 16-20 years constituting the second majority. Students aged 36 years and above represented 5.3% of the total respondents. The results confirms that majority of the students in the universities of education are dominated by early adults have mostly completed their three-year diploma education at the teacher training college and are pursuing a top up to obtain a degree. The sex of respondents who participated in the study. The male respondents constituted 69% while the female students who took part of the study were 31%. This confirms the assertion that males dominate especially in the Universities in Ghana and especially among those offering business degree programs in education.

#### Sex of Respondents and the use of Virtual Learning (Cross Tabulation)

The study sought to find out how gender can bring differences in terms of students who are friendly with the virtual learning and indeed applied them.

**Table 2 Cross tabulation of Sex and usage of Virtual Learning device among respondents**

Sex Of Respondents	Frequency	Used Not Used	
		Used	Not Used
MALE	131	50	
FEMALE	59	24	

The results from the Table 2 show that male students (131) were friendlier with the virtual learning technology and had used the virtual learning technology than their female counterparts. This figure of those who are aware of the virtual learning and use the virtual learning amounted to 72 % while those who did not use the virtual learning technology represents the 28 % of the total sample size. Respondents indicated that they used the virtual learning through their mails, blogs, lecturers' websites, online notes and e-books, YouTube videos on lectures, among others. They also download lecture notes, sample questions, latest accounting principles and models online. The attest that it was really helping them to be updated on some information outside their reach.

#### Benefits of Virtual learning in international education (Students' perspectives)

Respondents were asked to rank the benefits of virtual learning in relation to its contribution to international education. The top six benefits were then organized and analyzed in the table 4 below.

**Table 3: Benefits of Virtual learning in international education(Students' views)**

Benefit	Friedman Mean Rank	Rank
1.Many people get the chance to do international degree and certificate courses as they can sit at their rooms to learn	3.70	1 <sup>ST</sup>
2.It gives international students opportunity to offer varieties of online courses of their own choice that are not offered in their domestic countries	3.62	2 <sup>ND</sup>
3.It develops students ability to learn independently across the global boundaries	3.51	3 <sup>RD</sup>
4.It increases students' opportunity to become globally Competitive and informed	3.50	4 <sup>TH</sup>
5.It gives the students the chance to access classes or lectures at any time at where at any time	3.35	5 <sup>TH</sup>
6. It gives students the chance to have access to courses that are not available in their home country	3.31	6 <sup>TH</sup>
7. it provides students with lecture notes, sample questions to test their own abilities online	3.2	7 <sup>TH</sup>

Friedman non- parametric test was used to rank the benefits of virtual learning to international education from the students view and the test was significant at 0.02 significant level. Results from Table 4 above reveal that most students have knowledge about the benefits of virtual learning in achieving international education. Using Friedman nonparametric test to rank their views on the benefits or virtual learning to achieving international education, respondents rank "Virtual learning gives many people get the chance to do international degree and certificate courses as they can sit in their rooms to learn" as the highest benefit with mean rank of 3.70. This findings agrees with findings from Teo (2008) who found that one of the major benefits of virtual learning to acquire foreign degrees through international education.

Similarly, the results from the Table 3 show that virtual learning technology offered learners to greatest chance to choose among varieties of courses and programs which may not be available in their country. This benefit was ranked the second highest with mean rank of 3.62. Among other benefits ranked included: It develops students' ability to learn independently across their boundaries (3<sup>rd</sup> rank), It increases students' opportunity to become globally Competitive and informed (4<sup>th</sup> rank), It gives the students the chance to access classes or lectures at any time at where at any time(5<sup>th</sup> rank) and "It gives students the chance to have access to courses that are not available in their home country as the least ranked benefit.

#### Students' knowledge about the use of virtual learning devices

Table 3 below shows the students' on virtual learning devices both software and hardware. students revealed that they use software such as face book applications, skype, instagram, google among others. With regards to hardware, students used Laptops, desktops computers, smart phones, tablet and modems. These are represented in the table 5 below.

**Table 4: Students' knowledge about the use of virtual learning devices**

Software /hardware	Used	Not Used
Skype	230(87.1%)	34(12.9%)
Facebook	146(55.3%)	118(44.7%)
Yahoo mail	230(87.1%)	34(12.9%)
Instagram	215(81.4%)	49(19.7%)
Google account	212(80.3%)	52(19.7%)
Laptop	225(85.2%)	39(18.2%)
Desktop	221(84.1%)	42(15.9%)
Tablet	186(70.5%)	78(29.5%)
Modem	216(81.8%)	48(18.2%)
Smart phone	187(70.8%)	77(29.2%)

The results from Table 4 show that about 225 of the respondents representing (85.2%) used laptops. These laptops were given to them by the University. With the use of modem to get access to the internet, about 81.8 %



possessed modems. The results from the table 4 also revealed that about 87.1% of the respondents subscribe to Yahoo mail account and Skype chat accounts. These platform are mostly appropriate means to achieve a successful virtual learning in international education through asynchronous and synchronous means.

### Results from the Logistic Regression Analysis

The results from the logistic analysis from Table 4.0 below reveal the determinants of students' knowledge and awareness of the benefits of virtual learning especially in achieving international education and the expectation of curriculum. These factors influence students' usage and participation in the virtual learning platforms. These factors include age, sex, income level of students, place of residence, course of study and marital status.

**Table 5.0 Results from Logistic regression of determinants of virtual Learning usage among Students**

Variable	Odd Ratio	Standard Error	P-Value
Sex	0.029	0.293	0.013
Age	1.091	0.114	0.445
Marital status	0.24	0.104	0.967
Course	0.153	0.764	0.382
Residence	0.421	0.282	0.027
Income level of parent	0.462	0.687	0.407
Constant	1.792	0.827	0.003

Results from the Table 5.0 presents the odd ratios and the significant level ( $p < 0.05$ ). The odd ratios show the likelihood increase of odds of being in outcome category or decrease when the value of the predictor increases by one unit. The outcome from the logistic regression analysis from the table show that only sex and place of residence significantly influence students' usage and awareness of virtual learning. The odds of student being aware and experiencing virtual learning is 0.029 for the variable (sex). This implies the likelihood of using the virtual learning is 0.029 times higher for respondents who is male than their counterpart females. With regards to Residence, the odds is 0.421 times higher for respondents living in the urban areas than those in the rural areas. The Nagelkerke R- square of 0.7 and Cox & Snell R- Square of 0.56 indicating the goodness of fit that the model was well fitted. This results support that of Soyemi et al., (2012) and Osei et al., (2014) who also found that, sex, age and residential location influence the use of ICT and other virtual learning devices in the colleges of education.

### 4. Conclusion

The study sought to examine the benefits of virtual learning to international education and curriculum development drawing data from undergraduate students in one University of education in Ghana. The study also estimated the predictors of the use of virtual learning by respondents. Results from the study revealed that about 190 students out of the total number of students who participated in the study have used virtual learning in their educational pursuit representing the majority. The study found that benefits such 'Virtual learning gives many people the chance to do international degree and certificate courses as they can sit in their rooms to learn', It develops students' ability to learn independently across their boundaries. It increases students' opportunity to become globally Competitive and informed. Factors such as sex and place of residence significantly influence the usage of virtual learning among respondents. Future study can look at the knowledge among other department since this study only covered business education department and this was the limitation of the study.

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